PEER REVIEW HISTORY

BMJ Open publishes all reviews undertaken for accepted manuscripts. Reviewers are asked to complete a checklist review form (**http://bmjopen.bmj.com/site/about/resources/checklist.pdf**) and are provided with free text boxes to elaborate on their assessment. These free text comments are reproduced below.

ARTICLE DETAILS

TITLE (PROVISIONAL)	Electronic, mobile and telehealth tools for vulnerable patients with chronic disease: A systematic review and realist synthesis
AUTHORS	Parker, Sharon; Prince, Amy; Thomas, Louise; Song, Hyun; Milosevic, Diana; Harris, Mark

VERSION 1 – REVIEW

REVIEWER	Sheyu Li West China Hospital, Sichuan University, China.
REVIEW RETURNED	03-Oct-2017

GENERAL COMMENTS	The authors systematically studied the self-management promotion via electronic tools. The topic is interesting. The study was well conducted according to the RAMESES and PRISMA checklist. The finding is critical in the studied region and sets good example for realist syntheses in the future. I hope the following concerns may help the authors further improving their study. 1. I am worried about the searching strategy and the due date of the database searching. Excluding all papers with "medical record system" (some e-health and m-health equipment may also provide such module) and "child or adolescent" (some studies may include both children and adults) may miss some valuable references. I am not sure if the key words may cover all studies of Apps or applications. 2. Despite the authors stated their concerns about limiting the search due to 2015, an updated systematic search may greatly improve the study and solve the problem of limited quantity of the data as the authors stated as well. 3. As the authors included both RCTs and observational studies, both PRISMA and MOOSE checklists should be followed. 4. The details of quality appraisal could be provided at least in the supplementary data. 5. The authors well classified the mechanisms in each included study. But could the authors summarize them using the methods of statistical description such as constitutional ratio?

REVIEWER	Richard Milani Ochsner Health System New Orleans, LA USA
REVIEW RETURNED	23-Nov-2017

GENERAL COMMENTS	Questions and Comments

	1. The authors' state (lines 10-11): "In this review, we specifically sought to explore mechanisms related to patient self-efficacy and self-management." This is not an adequate study question. The authors should be more explicit in stating clearly the purpose of the research (including populations that they wish to study). The authors go on to have a section entitled "Defining the research question" without ever defining the question.
	2. In Table 2 only lung cancer and colorectal cancers were included among cancers. Why exclude other forms of cancer?
	3. Table 2: Hypertension is among the most common of chronic diseases, prevalent among vulnerable populations, has poor rates of control, and is amenable to management via telehealth. Why was this not included?
	4. Did the studies chosen for review require the entire population to be vulnerable, or were studies included that a portion of the population was deemed vulnerable?
	5. The sections on Theory Mapping and Mechanisms are too long.

VERSION 1 – AUTHOR RESPONSE

Manuscript ID bmjopen-2017-019192

Response to referee comments 28/02/2018

Reviewer	Reviewer comment	Response to reviewer comment
Editorial	a) The Abstract/methods sections need improving. These could be a lot more informative e.g. what databases were searched? How was study quality assessed? etc. We suggest taking a look at the abstracts of other similar systematic review papers published in BMJ Open as examples.	We have revised the abstract to be more informative where we could, given the 300-word restriction.
	b) We felt that the paper needed a bit more focus and, like the reviewers, we felt it would help if you made	Thank you – we have specified the research question and also changed the title of the review to: "Electronic, mobile and telehealth tools for vulnerable patients with chronic disease: A systematic review and realist synthesis"

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	your research question clearer (following which you may also like to re-think the title).	We have also revised some sections of the manuscript using track changes to help focus the manuscript
	c) Please update your literature search, which is more than 12 months old now.	We have now updated the literature search to 12/2/2018
	d) Contrary to reviewer 1's comments, we do not think that you need to include both MOOSE and PRSIMA in the submission. We also note that you have included the results of the quality appraisal in tables 4 and 5. This does not need to be moved to the supplementary information.	Thank you
Reviewer 1: Sheyu Li West China Hospital, Sichuan University, China.	a) I am worried about the searching strategy and the due date of the database searching. Excluding all papers with "medical record system" (some e-health and m-health equipment may also provide such module) and "child or adolescent" (some studies may	The search strategy was extensively tested and modified for all databases based on the definitions provided for the MESH terms in those databases.

We added an exclusion around '**Medical records systems computerized'** because this MESH term was returning extensive numbers of citations that were not within the scope of this review. The Medline definition for this MESH term is **"Computer-based systems for input, storage, display, retrieval, and printing of information contained in a patient's medical record"**

Our aim was to maximise sensitivity and specificity of the search. This MESH term reduced the sensitivity and specificity, hence we |

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	include both children and adults) may miss some valuable references. I am not sure if the key words may cover all studies of Apps or applications.	added it as a specific exclusion. Our question was specifically related to adults with chronic disease. Despite excluding citations that had a mix of children and adults, we still retrieved some citations where there was a mix of adults and children. Unless these studies had a substantial number of adults and specifically analysed the data with respect to age, the citations were excluded.
	b) Despite the authors stated their concerns about limiting the search due to 2015, an updated systematic search may greatly improve the study and solve the problem of limited quantity of the data as the authors stated as well.	We have rerun the original search in all databases to February 2018 which yielded 655 citations. We have included three new studies and added an additional two citations relating to trials which were in the original review.
	c) As the authors included both RCTs and observational studies, both PRISMA and MOOSE checklists should be followed.	See Editorial comments above – No change required
	d) The details of quality appraisal could be provided at least in the supplementary data.	See Editorial comments above – No change required
	e) The authors well classified the mechanisms in each included study. But could the authors	We have consulted widely with statistical colleagues and we are unclear as to what a constitutional ratio is, and whether therefore it is appropriate in this instance. We are happy to consider this method if the referee could provide additional information and advice as to how this method can be applied to this review.

Reviewer	Reviewer comment	Response to reviewer comment
	summarize them using the methods of statistical description such as constitutional ratio?	The review uses a narrative approach but also a realist matrix to structure the synthesis around the mechanisms identified. The mechanisms were infrequently reported, could be not identified in some studies and in the others, they were proposed by the authors. We are unsure how a ratio can be used in this instance?
Reviewer 2: : Richard Milani Ochsner Health System, New Orleans, LA, USA	a) The authors' state (lines 10-11): "In this review, we specifically sought to explore mechanisms related to patient self-efficacy and self-management." This is not an adequate study question. The authors should be more explicit in stating clearly the purpose of the research (including populations that they wish to study). The authors go on to have a section entitled "Defining the research question" without ever defining the question.	We have revised the manuscript and inserted a heading – Research question' where we have stated the question and provided information about the population and interventions of interest.
	b) In Table 2 only lung cancer and colorectal cancers were included among cancers. Why exclude other forms of cancer?	In defining chronic disease, we used the following: National Public Health Partnership. Prevention chronic disease: A strategic framework, background paper. National Public Health Partnership; 2001 (Also available from: http://www.health.vic.gov.au/archive/archive2014/nphp/publication s/strategies/chrondis-bgpaper.pdf

This is a seminal Australian resource which sets out a strategic |

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		framework for the prevention and control of chronic non-communicable diseases in Australia. The framework identified 12 chronic conditions relevant in Australia which are listed in table 2. Lung and colorectal cancer are the only two cancers listed. This review formed the basis of further IMPACT work and we hence wanted our results to be relevant for the Australian context.
	c) Table 2: Hypertension is among the most common of chronic diseases, prevalent among vulnerable populations, has poor rates of control, and is amenable to management via telehealth. Why was this not included?	We did not exclude hypertension. In fact, our search yielded many studies where the patients had hypertension either alone or as a comorbid condition with Diabetes etc. In these instances, the exclusion of these studies was due to one or both of the following 1. We were not interested in devices or programs used for simple self-monitoring of symptoms. Self-monitoring could be a component of the intervention provided the intervention also offered a broader interactive intervention. 2. The population did not meet the IMPACT definition of vulnerable
	d) Did the studies chosen for review require the entire population to be vulnerable, or were studies included that a portion of the population was deemed vulnerable?	We reviewed many articles where the populations were mixed. In these studies, the vulnerable populations tended to form a very low percentage of the entire sample. We excluded data where this was the case, or where the outcomes were not assessed for the specific vulnerable population group, which was also frequently the case. The IMPACT study has a clear focus on vulnerable groups https://www.monash.edu/medicine/spahc/research/impact Since this review was done to inform future IMPACT work, it made little sense for us to include studies where vulnerability was not a predominant feature.
	e) The sections on Theory Mapping and Mechanisms are too long.	We have reduced this section of the paper although it is essential in a realist approach to make a link between theory and the underlying assumptions about how an intervention might be expected to have an effect

VERSION 2 – REVIEW

REVIEWER	Sheyu Li West China Hospital, Sichuan University, Chengdu, China
REVIEW RETURNED	08-Mar-2018

GENERAL COMMENTS	Thanks for the revise from the authors. I have no additional comments. For constitutional ratio, I am sorry for the misunderstanding of the term. Please just think it as 'proportion' of each item.

REVIEWER	Richard Milani Ochsner Health System, USA
REVIEW RETURNED	12-Mar-2018

GENERAL COMMENTS	The authors have markedly improved their manuscript.